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【国際セッション・オーラルプレゼンテーション】

## Physical activity and intra-abdominal fat reduction: effects of age, obesity phenotype and vigorous physical activity

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**Background:** Excess intra-abdominal fat (IF) is strongly associated with morbidity and mortality risks. Increased physical activity (PA) could be an effective way to reduce metabolic disorders since IF accumulations are induced in part by physical inactivity. Despite numerous studies reported PA-induced IF reductions [1], the results vary considerably depending on baseline characteristics of the participants. In addition, the optimal exercise way such as intensity of PA to maximize IF reduction has not been fully elucidated, especially in Japanese men. Here we report our recent findings from three studies which examined the effects of age, obesity phenotype, and vigorous PA on IF responses to increased PA in obese Japanese men.

**Methods:** [Study 1] We gathered 36 obese men and divided them into middle-aged group (<50 yr,  $n = 20$ ) or older group ( $\geq 60$  yr,  $n = 16$ ). [Study 2] We recruited 57 obese men and divided them into moderate IF (MIF;  $< 200 \text{ cm}^2$ ,  $n = 33$ ) group or high IF (HIF;  $\geq 200 \text{ cm}^2$ ,  $n = 24$ ) group, based on their initial IF levels according to the previous study [2]. [Study 3] We divided 37 obese men into low vigorous PA group ( $n = 19$ ) or high vigorous PA group ( $n = 18$ ), based on the median time spent (34.3 min/week) in vigorous PA (over 6.1 metabolic equivalents) throughout the program. We assessed PA by a single-axis accelerometer before and during the program. All participants from the three studies engaged in a 3-month supervised exercise program consisting primarily of brisk walking and mild jogging on a regular basis (3 days/week). We measured IF levels before and after the program by computed tomography, and counseled all participants not to change their baseline dietary habits.

**Results:** [Study 1] With a 2–3 kg of weight loss, IF levels were significantly decreased by  $41 \pm 43$  (SD)  $\text{cm}^2$  for the middle-aged group and  $32 \pm 29 \text{ cm}^2$  for the older group. However, the two-way repeated ANOVA revealed no significant interaction ( $P = 0.51$ ). [Study 2] Increased PA reduced IF levels by  $15 \pm 26 \text{ cm}^2$  in MIF group and  $43 \pm 42 \text{ cm}^2$  in HIF group, and the difference remained significant after adjusting for potential confounders ( $P = 0.04$ ). [Study 3] We observed reductions in IF levels by  $18 \pm 38 \text{ cm}^2$  for the low vigorous PA group and  $30 \pm 23 \text{ cm}^2$  for the high vigorous PA group. Time spent in vigorous PA during the program inversely correlated to IF reductions after adjusting for initial levels of IF and vigorous PA, and weight changes ( $r = -0.43$ ,  $P = 0.01$ ).

**Conclusion:** These studies suggest that IF reduction induced by increased PA may be affected by obesity phenotype, and greater intensity of PA, but not by their age in obese Japanese men.

### Reference

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